

NEVADA DIVISION OF ENVIRONMENTAL PROTECTION

FACT SHEET

(pursuant to NAC 445A.236)

Permittee: Verdi Meadows Utility Company, Inc.
P.O. Box 459
Verdi, Nevada 89439

Permit: NEV20007 – Major Modification

Discharge Location: Verdi Meadows Wastewater Treatment Plant
Glen Meadows Village/River Oaks Subdivision
1855 Highway 40 West
approximately 0.5 miles North of the Truckee River
Verdi, Washoe County, Nevada 89439

Latitude 39° 31' 30" N
Longitude 119° 58' 00" W

Township 19 N, Range 18 E, Section 9 MDB&M

Permitted Flow: 0.0280 million gallons per day (MGD) – Maximum 30-day average influent flow.

General: The Permittee operates the Verdi Meadows Wastewater Treatment Plant (VMWWTP) that serves the Glen Meadows Village/River Oaks Subdivision (GMV/ROS) and has proposed to increase the permitted capacity of the plant from 0.0200 MGD to 0.0280 MGD. The Permittee has exceeded the 30-day average influent limitation since October 2001. The service area is limited to the GMV/ROS that is built-out at 170 single-family homes and a community clubhouse. This facility was originally permitted in July 1982 to Dr. Clyde Emory, Jr., for Glen Meadows – Verdi Meadows with a permitted capacity of 0.0510 MGD. The facility has reportedly been in operation since 1973.

A lift station downgradient of GMV/ROS collects all wastewater and pumps it via an approximately 3,300-foot, 6-inch diameter force main to the treatment works that is upgradient of the subdivision.

At the last permit renewal, VMWWTP was classified as a partial mix pond system with facultative ponds for polishing. Since 2001, the four pond VMWWTP has operated as a sequential, re-circulating batch reactor (SRBR) with one settling/sludge storage pond, two reactors, and an effluent disposal pond, a modified pond system providing secondary treatment. The SRBR process includes typical stages of a sequencing batch reactor (SBR), i.e. react, idle, and decant phases. Unlike an SBR process that occurs in a single basin, the SRBR relies on the recycling of activated sludge between the two reactors. The settled secondary sludge is returned to the storage pond. The VMWWTP could be converted to a conventional SBR, if necessary.

In 1997, the three SRBR ponds were lined with bentonite amended native soils. In laboratory hydraulic conductivity tests, ASTM D5084, these amended soils were determined to have hydraulic conductivities of less than 1.0×10^{-6} centimeters per second (cm/sec). The SRBR effluent is piped to the unlined disposal pond for infiltration and evaporation. The disposal pond has approximately 42 acre-feet of storage capacity and has a depth of 30 feet to the spillway inlet. Based on a water balance, the Permittee has estimated the infiltration rate as 1.6×10^{-5} cm/sec. As part of this modification, the disposal pond will be included as part of the treatment process. Within the pond, there is volatilization and biological activity that further reduce the total nitrogen concentrations. The effluent will also be filtered as it travels through the pond bottom deposits and the soil profile to

groundwater.

Monitoring well MW-1 was constructed to a depth of 97 feet in 1984 with a static water level of 42 feet below ground surface (BGS). MW-2 was later constructed approximately 20 feet from MW-1 and 350 feet downgradient of the discharge pond. MW-2 data has been reported since April 1996. A well log for MW-2 has not been located but the well was reportedly constructed to a depth of approximately 130 feet. This well is frequently reported as “dry” or “no test”. MW-1 was subsequently abandoned. Monitoring well MW-3 was constructed in December 2000 to a depth of 24 feet. At the time of construction, the depth to the static water level in MW-3 was 18 feet BGS. MW-3 was constructed to intercept a seep approximately 200 feet downgradient of the disposal pond. The GMV/ROS water supply well is approximately 1,700 feet downgradient of the disposal pond with an initial static water level of approximately 27 feet BGS. There is reportedly in excess of 200 feet of drawdown in the supply well. The ranch well is approximately 3,100 feet from the disposal pond. Data from this well is of questionable use, it is the former supply well for a small dairy, is located too far from the treatment plant, and is screened over too large an interval to be used as a monitoring well.

The Permittee has previously reused treated effluent upgradient of the disposal pond but further authorization was not requested as part of this permit modification.

A draft facility plan for the Lawton Verdi Wastewater Project has been prepared. The U.S. Army Corps of Engineers is preparing an environmental assessment for the Project. The actual schedule of the Project is dependent on the environmental review and the availability of federal and local funding. As required by NRS 445A.540.6.b., GMV/ROS will connect to the Lawton-Verdi Interceptor, when constructed.

The facility is in the process of complying with NRS 445A.540. The facility is regulated by the Public Utilities Commission.

Receiving Water Characteristics: The groundwater in the area is of good quality and is reported to be in excess of 100 feet BGS in the vicinity of the SRBR ponds. The GMV/ROS water supply well meets drinking water standards but has elevated ammonia concentrations, approximately 4.5 mg/L. The supply well has the following average constituent concentrations: nitrate as N <0.5 mg/L; chlorides 2.5 mg/L; and TDS 250 mg/L.

MW-1 water quality data has not been located. MW-2 had the following average constituent concentrations: nitrate as N 0.4 mg/L and chlorides 5 mg/L.

At the time of MW-3 construction, the shallow groundwater had the following constituent concentrations: nitrate as N 0.2 mg/L; ammonia as N <0.1 mg/L; total Kjeldahl nitrogen (TKN) 0.25 mg/L; chlorides 25 mg/L; and total dissolved solids (TDS) 484 mg/L. These values have remained consistent with the following 2001 average concentrations: nitrate as N 0.1 mg/L; ammonia as N <0.1 mg/L; TKN 0.8 mg/L; chlorides 33 mg/L; and TDS 540 mg/L. Since the TDS and chlorides concentrations of the disposal pond and the MW-3 waters closely match, MW-3 is assumed to be intercepting infiltrated effluent that has not yet mixed significantly with groundwater.

Based on a 1996 mass spectrometer analysis of the nitrogen isotopes present in the treatment pond water, the water supply well, monitoring well 2 and the ranch well, the University of California, Davis determined that the source of elevated ammonia levels in water supply and ranch wells were from a source other than VMWWTP.

Characteristics of Discharge: The 30-day average influent flow is 0.0227 MGD. The SRBR discharge to the disposal pond has the following average constituent concentrations: 5-day, carbonaceous biochemical oxygen demand (CBOD₅) 24 mg/L; total suspended solids (TSS) 94 mg/L; fecal coliform 29,000 cfu/100 ml; pH 7.85; TKN 20.1 mg/L; and nitrate as N 5.2 mg/L. The facility has not consistently met the required 85% CBOD₅ and TSS removal standards of performance.

Proposed Permit Limitations: During the period beginning on the effective date of this permit and lasting

until the permit expires, the Permittee is authorized to discharge from the SRBR, Outfall 001, to groundwaters of the State via the disposal pond.

- a. Samples taken in compliance with the monitoring requirements specified below shall be collected at a location:
 - i. Influent flow meter;
 - ii. Influent wastewater to the primary SRBR reactor;
 - iii. Effluent discharge to the disposal pond, Outfall 001;
 - iv. Disposal pond water; and
 - v. Disposal pond staff gage.
- b. The effluent discharge shall be limited and monitored in accordance with the following specifications:

EFFLUENT DISCHARGE LIMITATIONS

PARAMETER	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS		
	30 - Day Average	Daily Maximum	Sample Location	Measurement Frequency	Sample Type
Flow (mgd)	0.028	---	i.	Continuous	Flow Meter
Carbonaceous Biochemical Oxygen Demand, 5-day (mg/L)	Monitor & Report		ii., iii.	Monthly	Discrete ¹
Total Suspended Solids (mg/L)	Monitor & Report		ii., iii.	Monthly	Discrete
pH (SU)	6.0 = pH = 9.0		ii., iii.	Monthly	Discrete
Nitrate –N (mg/L)	Monitor & Report		iv.	Quarterly	Discrete
Nitrite –N (mg/L)	Monitor & Report		iv.	Quarterly	Discrete
Ammonia –N (mg/L)	Monitor & Report		iv.	Quarterly	Discrete
Total Kjeldahl Nitrogen –N (mg/L)	Monitor & Report		iv.	Quarterly	Discrete
Total Nitrogen –N (mg/L)	Monitor & Report		iv.	Quarterly	Discrete
Chlorides (mg/L)	Monitor & Report		iv.	Monthly	Discrete
Total Dissolved Solid (mg/L)	Monitor & Report		iv.	Monthly	Discrete
Fecal Coliform (cfu or mpn/100 mL)	Monitor & Report		iii.	Monthly	Discrete
Water Level (feet)	---	27	v.	Weekly	Discrete

Notes:

- ¹: The Permittee is encouraged to take composite versus discrete samples.
 mgd: Million gallons per day. cfu or mpn/100 mL: Colony forming units or most probable number per 100 milliliters.
 mg/L: Milligrams per liter. SU: Standard units.
 -N: As nitrogen.

Discrete groundwater samples shall be collected to confirm the effective protection of groundwater under the established discharge conditions of this permit.

- a. Discrete samples shall be collected from each groundwater monitoring well, including MW-2 (or MW-4) and MW-3, and each lysimeter/monitoring well, including L-1 (or MW-5).
- b. Groundwater monitoring wells and lysimeter(s) shall be conspicuously labeled, capped to prevent migration of surface contaminants to the groundwater, and locked to restrict access.
- c. The Permittee shall monitor all new and existing groundwater monitoring wells and lysimeter(s) or the following parameters:

GROUNDWATER MONITORING

PARAMETER	LIMITATIONS	SAMPLE LOCATIONS	FREQUENCY	SAMPLE TYPE
Depth to Groundwater (feet)	Monitor & Report	MW-3, L-1/MW-5	Monthly	Field Measurement
		MW-2/4 ¹	Quarterly	
Groundwater Elevation (feet)	Monitor & Report	MW-3, L-1/MW-5	Monthly	Calculate
		MW-2/4 ¹	Quarterly	
Nitrate –N (mg/L)	10.0	MW-3, L-1/MW-5	Monthly	Discrete
		MW-2/4 ¹	Quarterly	
Nitrite –N (mg/L)	Monitor & Report	MW-3, L-1/MW-5	Monthly	Discrete
		MW-2/4 ¹	Quarterly	
Ammonia –N (mg/L)	Monitor & Report	MW-3, L-1/MW-5	Monthly	Discrete
		MW-2/4 ¹	Quarterly	
Total Nitrogen –N (mg/L)	Monitor & Report	MW-3, L-1/MW-5	Monthly	Discrete
		MW-2/4 ¹	Quarterly	
pH (standard units)	Monitor & Report	MW-2, L-1/MW-5	Monthly	Discrete
		MW-3/4 ¹	Quarterly	
Chlorides (mg/L)	Monitor & Report	MW-3, L-1/MW-5	Monthly	Discrete
		MW-2/4 ¹	Quarterly	
Total Dissolved Solids (mg/L)	Monitor & Report	MW-3, L-1/MW-5	Monthly	Discrete
		MW-2/4 ¹	Quarterly	

¹: If it is necessary to construct monitoring well MW-4, this replacement well must be sampled monthly for the first four months after completion and quarterly thereafter.
mg/L: Milligrams per liter
-N: As nitrogen.

- d. The detection of concentrations of nitrate as nitrogen (-N) in groundwater samples invoke the following limitations and response requirements:
 - i. If the nitrate-N concentrations increase to 7.0 milligrams per liter (mg/L), an alternate method of disposal, approved by the Division, shall be selected.
 - ii. If the nitrate-N concentration in groundwater increases to 9.0 mg/L, construction of an approved alternate site or facility must begin.
 - iii. If the nitrate-N concentration increases to 10.0 mg/L, the discharge to groundwater must cease.

Schedule of Compliance: The Permittee shall implement and comply with the provisions of the schedule of compliance after approval by the Administrator, including in said implementation and compliance, any additions or modifications which the Administrator may make in approving the schedule of compliance. The Permittee shall implement and/or execute the following scheduled compliance requirements:

- a. Upon the effective date of this permit, the Permittee shall achieve compliance with the permit and effluent quality.
- b. If an interceptor, constructed to transport wastewater to a municipal treatment plant, becomes available, the Glen Meadows Village/River Oaks Subdivision shall be connected to the interceptor and the treatment plant shall be abandoned in accordance with a schedule imposed by the Division. The treatment plant shall be abandoned in a manner approved by the Division.
- c. Within forty-five (45) days of the effective date of this permit, the Permittee shall submit to the Division a boring log and completion details of the lysimeter, or monitoring well, constructed at the exterior toe of the discharge pond embankment.
- d. Within sixty (60) days of the effective date of this permit, the Permittee shall submit to the Division a revised O&M Manual.
- e. If, on the effective date of this permit, monitoring well MW-2 cannot be sampled, the Permittee shall construct a new groundwater monitoring well, MW-4, within 30 feet of MW-2 and submit the well log, completion diagram, and well location, latitude and longitude, to the Division within sixty (60) days of the effective date of the permit.

Rationale for Permit Requirements: Monitoring is required to assess the loading to the treatment plant, the level of treatment being provided, and to determine the impacts of the discharge on groundwater quality.

Due to the proximity of the VMWWTP to the Truckee River, the amount of groundwater monitoring has been increased. If MW-3 is intercepting effluent, as is likely the case, the nitrogen concentrations in the effluent are being significantly reduced between the discharge to the disposal pond and MW-3. To verify this reduction, the draft permit requires a new monitoring point, lysimeter L-1 or monitoring well MW-5, depending on depth to groundwater, to be constructed to intercept the infiltrating effluent as close as possible to the discharge, thereby reducing the potential effects of dilution. Because a portion of the effluent may be infiltrating to the groundwater bypassing the MW-3 and L-1/MW-5 monitoring, MW-2 must be replaced, if the groundwater has been drawdown below the MW-2 screened interval.

More restrictive groundwater nitrate concentration standards were considered and rejected because of the treatment the water is receiving and the groundwater drawdown in the area. The static water level in the GVM/ROS water supply well has been rapidly declining and is currently more than 150 feet below the river bed elevation. Effluent mixed with groundwater is more likely to be drawn to the water supply well, 1,700 feet from the disposal pond, than to flow to the river. Therefore, it is not necessary to impose the Truckee River standards that are more restrictive than the drinking water standards on any of the permit monitoring locations.

The secondary treatment standards for 5-day, carbonaceous biochemical oxygen demand and total suspended solids have been temporarily removed from the permit. The Permittee has not consistently achieved these standards of treatment, particularly in the summer. This temporary removal will allow the Permittee to adjust the treatment system with the goal of meeting secondary effluent standards. If it is necessary to renew this permit in March 2004, secondary standards for these two parameters will be imposed on the effluent discharge to the disposal pond in the re-issued permit.

Proposed Determination: The Division has made the tentative determination to issue the proposed permit modification with specific requirements for achieving effluent compliance and protection of State groundwater resources.

Procedures for Public Comment: Notice of the Division's intent to modify permit NEV20007, authorizing the operation to discharge treated groundwater for irrigation and percolation into groundwater of the State subject to the conditions contained within the permit, is being sent to the **Reno Gazette-Journal** for publication. Notice is also mailed to interested persons on our mailing list.

Anyone wishing to comment on the proposed permit can do so in writing for a period of thirty (30) days following the date of publication of the public notice in the newspapers, and at the discretion of the Administrator, the comment period can be extended. The date and time by which all written comments are to be postmarked or transmitted to the Division via fax or e-mail is October 28, 2002 by 5:00 P.M.

A public hearing on the proposed determination can be requested by the applicant, any affected State or interstate agency, or any interested agency, person, or group of persons. Requests must be filed within the comment period and must indicate the interest of the person filing the request and reasons why a hearing is warranted.

Any public hearing held by the Administrator is conducted in the geographical area of the proposed discharge or any other area the Administrator determines to be appropriate. All public hearings are conducted in accordance with NAC 445A.238. The final determination of the Administrator may be appealed to the State Environmental Commission pursuant to NRS 445A.605.

Prepared by: Bruce Holmgren
Date: September 2002

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